

## A new genus and new species of Rhodacaridae (Acari) from the Afrotropical Region

by

LEONORA C. JORDAAN, G. C. LOOTS and P. D. THERON

Department of Zoology, Potchefstroom University for CHE, Potchefstroom, 2520

A new genus, *Pararhodacarus*, and two new species, *P. intermedius* and *Rhodacarus thysi* are described. A key to the Afrotropical species of *Rhodacarus* is given.

### INTRODUCTION

A new species of the Rhodacaridae has been found which does not possess an ambulacrum on tarsus I. This is regarded as an important characteristic for the differentiation of the genus *Rhodacarus* (Lee 1970). In this species, a setal brush is present at the base of the movable digit of the chelicera which is typical of *Afrogamasellus* (Loots & Ryke 1968) and *Afrodacarellus* (Hurlbutt 1973). The overlap of these characteristics allows this species to be placed in a genus of the Rhodacarinae only if the genus concepts (*sensu* Lee 1970) can be extended. This species is consequently accommodated in a new genus, *Pararhodacarus*. A new species of *Rhodacarus*, *R. thysi*, was also found during this study and described below.

The female holotype and one female paratype of *Pararhodacarus intermedius* gen. nov., spec. nov., together with the female holotype and three female paratypes of *Rhodacarus thysi* spec. nov., are deposited in the mite collection of the Zoology Department, Potchefstroom University for CHE. One female paratype of *P. intermedius* and two female paratypes of *R. thysi* are deposited in the National Collection of Acari, Plant Protection Research Institute, Pretoria.

### Genus *Pararhodacarus* gen. nov.

Type-species; *Pararhodacarus intermedius* spec. nov.

This genus can be characterized as follows: small and lightly sclerotized; gnathosoma relatively large and second and third pairs of gnathosomal setae situated alongside each other; capitular groove very narrow; anterior margin of gnathotectum forms a smooth, single, median projection; setal brush present at base of movable digit; setae j1-2 and z1 situated on anterior margin of podonotal shield; four refractive structures present approximately between setae j6; one pair of pore-bearing pre-endopodal shields present and one pair of endopodal shields occurs between coxae III-IV; ambulacrum I absent and seta pl-4 present on tarsus IV, otherwise leg chaetotaxy normal for Rhodacarinae.

The type-species is at present the only representative of this genus.

***Pararhodacarus intermedius* spec. nov., Figs 1-7**

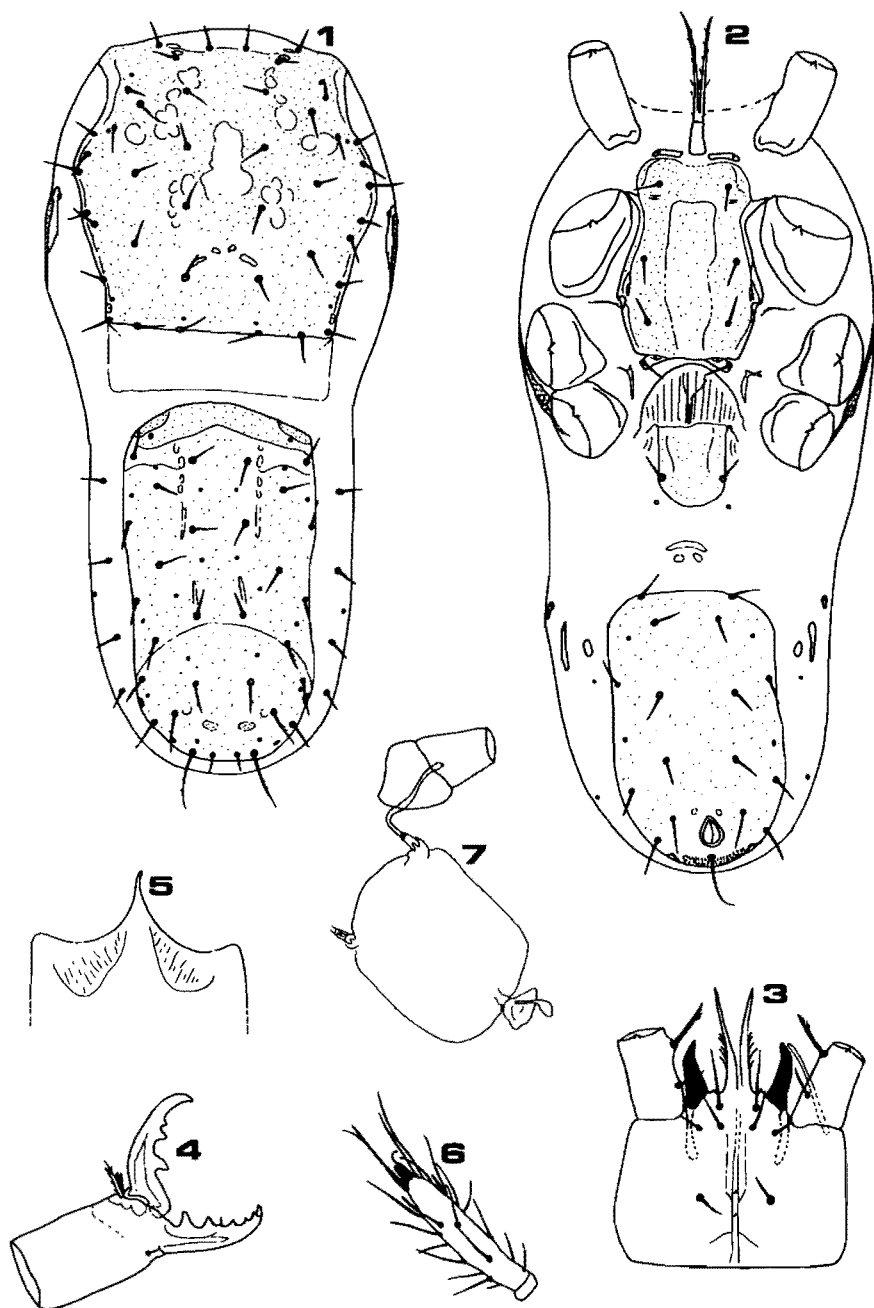
Female. Dimensions. Length (excl. gnathosoma), 322  $\mu\text{m}$ ; breadth, 142  $\mu\text{m}$ ; leg I, 260  $\mu\text{m}$ ; leg IV, 208  $\mu\text{m}$ ; length of genital shield, 53  $\mu\text{m}$ ; breadth (through bases of genital setae), 27  $\mu\text{m}$ ; length of sternometasternal shield, 76  $\mu\text{m}$ ; breadth (through bases of sternal setae II), 50  $\mu\text{m}$ ; postanal seta, 20  $\mu\text{m}$ ; vertical setae, 10  $\mu\text{m}$ ; setae r3, 13  $\mu\text{m}$ ; setae J5, 8  $\mu\text{m}$ ; setae z5, 23  $\mu\text{m}$ ; setae R4, 8  $\mu\text{m}$ .

Dorsum. Dorsal shield divided into two punctate shields. Podonotal shield relatively broad, not fragmented into smaller parts, displays areas like those anterior to setae j1 which are poorly defined and not punctate; at least six pairs of pores present on shield and a poorly defined, unsclerotized smooth strip present posteriad of podonotal setae (Fig. 1); chaetotaxy of podonotal shield as follows: setae 6j, 5z, 5s and 5r present; setae j1, j2 and z1 situated on anterior margin of shield; all dorsal setae of podonotal region situated on podonotal shield; setae simple, of even length, except for setae r3 which are slightly longer than others; four refractive structures occur anteriad of setae j6.

Opisthonotal shield with convex anterior margin, line ornamentations present on anterior part; approximately 12 pairs of pores and poorly defined oviform or circular figures on shield; normal complement of five setae each present in J, Z and S series; setae Z5 conspicuously longer than other opisthonotal setae; setae J4, Z3-5 and S4 finely serrate, setae R1-4 situated on lateral interscutal membrane; one pair of pore-bearing platelets between setae R2 and R3; area posterior to setae J3 more darkly sclerotized, rounded.

Venter. Tritosternum normal for Rhodacarinae. Pre-endopodal shields elongate, each with lateral pore. Sternal shield continuous with presternal region, anteriorly and laterally with punctations, central area poorly sclerotized; faint lines present on anterolateral and lateral aspects; with sternal setae I-IV and three pairs of pores, fourth pair of setae, associated with weakly developed third pair of pores, situated on posterolateral projections of shield; shield with a pair of lateral indentations posterior to second pair of pores. One pair of endopodal shields visible between coxae III and IV; exopodal shields absent. Anterior margin of epigynial process of genital shield semicircular; vaginal shield (indicated in dotted lines) visible on ventral aspect; genital shield with convex posterior margin and provided with fine punctations and setae. Paragenital pores situated on opisthogastric membrane posterior to shield. Each peritremal shield forms a narrow pore-bearing strip posterior to stigmata, anterior part reduced, with two pores each, with posterior pore relatively small (Fig. 1); peritremes relatively short, not extending beyond dorsal setae r3. Three weakly sclerotized platelets situated between genital and ventrianal shields, (Fig. 2). Metapodal shields tripartite, consisting of two small platelets with an elongated one between them. Ventrianal shield with a slightly convex anterior margin, punctate, with three pairs of pores, posterior pair relatively large, semicircular; setae Jv1-3, Zv1-3, one pair of Sv setae and circumanal setae present. Postanal seta relatively long, postanal pad prominent. Paranal setae in line with anterior margin of anal opening, two circular figures situated anterior to this opening. Two pairs of small pore-bearing platelets present on lateral interscutal membrane.

Figs 1-7. *Pararhodacarus intermedius* gen. nov., spec. nov., Female. 1. Dorsum. 2. Venter. 3. Gnathosoma. 4. Chelicera. 5. Gnathotectum. 6. Tarsus I. 7. Spermatheca.



**Gnathosoma.** Relatively large. Malae externae short, slightly incurved; malae internae relatively long with smooth tips, laterally serrate; small, pointed projections situated between bases of both pairs of malae. Salivary styli well developed. Gnathosomal setae subequal (Fig. 3), second and third pairs adjacent. Seta v-2 on the palp trochanter incrassate, serrate; al-seta on palp femur situated on proximal third; palp genu with seta al-1 branched, seta al-2 spatulate, almost adjacent. Capitular groove exceedingly narrow, poorly developed anteriorly, with two rows of posterior deutosternal denticles, each with a single tooth; two pairs of lines present next to groove. Movable cheliceral digit (Fig. 4) tridentate with basal setal brush; fixed digit with subapical tooth, four teeth and pilus dentilis; proximal teeth on both digits relatively large; dorsal seta present, lyrifissures could not be detected. Anterior margin of gnathotectum (Fig. 5) consists of a single smooth median projection with two membranous parts posteriorly. Palpapotele tripartite.

**Legs.** Tarsus I lacking ambulacrum (Fig. 6), distally with relatively broad, obtuse sensory setae and a curled seta; smaller sensory setae visible laterally. Tarsi II-IV normal for the Rhodacarinae, except seta pl-4 present on basitarsus IV. Relatively large, branched and finely serrate setae present on some leg segments, particularly noticeable on trochanter I (a dorsal seta), trochanter and basifemur II (al setae), tarsi of legs II-IV and genu and tibia IV (ventral setae). Relatively small serrate setae also present. Spinous, incrassate setae occur on tarsi II-IV; setae pd-3 and ad-3 on tarsus IV elongate.

**Spermatheca** (Fig. 7). Solenostomes open on trochanters IV. The relatively broad, well sclerotized tubuli open into a large membranous sacculus by means of distinct and darkly sclerotized rami.

**MATERIAL EXAMINED.** Holotype female: SOUTH AFRICA: from soil underneath *Tarchonanthus* sp., 28 km north of Kuruman, Northern Cape, 02.xii.1977, L. C. Jordaan; 2 female paratypes, same data as holotype.

### Genus *Rhodacarus* Oudemans

*Rhodacarus* Oudemans, 1902: 50; Ryke 1962: 81; Loots 1969: 47-49; Lee 1970: 26-29.

Type-species: *Rhodacarus roseus* Oudemans, 1902.

#### Key to the Afrotropical species of *Rhodacarus* (Females)

- |   |   |                                |
|---|---|--------------------------------|
| 1 | Opisthonotum with 18 pairs of setae .....   | <i>R. ananasi</i> Ryke         |
| — | Opisthonotum with 19 pairs of setae .....   | 2                              |
| — | Opisthonotum with 20 or more pairs of setae .....   | 3                              |
| 2 | Podonotum with 21 pairs of setae; pre-endopodal shields present; fixed cheliceral digit with five teeth .....         | <i>R. rhodacaropsis</i> Ryke   |
| — | Podonotum with 23 pairs of setae; pre-endopodal shields absent; fixed cheliceral digit with more than ten teeth ..... | <i>R. sublapidius</i> Ryke     |
| 3 | Podonotal shield divided into four parts .....  | 4                              |
| — | Podonotal shield entire and provided with V-shaped suture .....   | <i>R. ruwenzoriensis</i> Loots |
| 4 | Pre-endopodal shields present; sternal setae I on punctate presternal membrane .....                                  | <i>R. berrisfordi</i> Loots    |
| — | Pre-endopodal shields absent; sternal setae I on anterior margin of sternometasternal shield .....                    | <i>R. thysi</i> spec. nov.     |

***Rhodacarus thysi* spec. nov.**, Figs 8–13

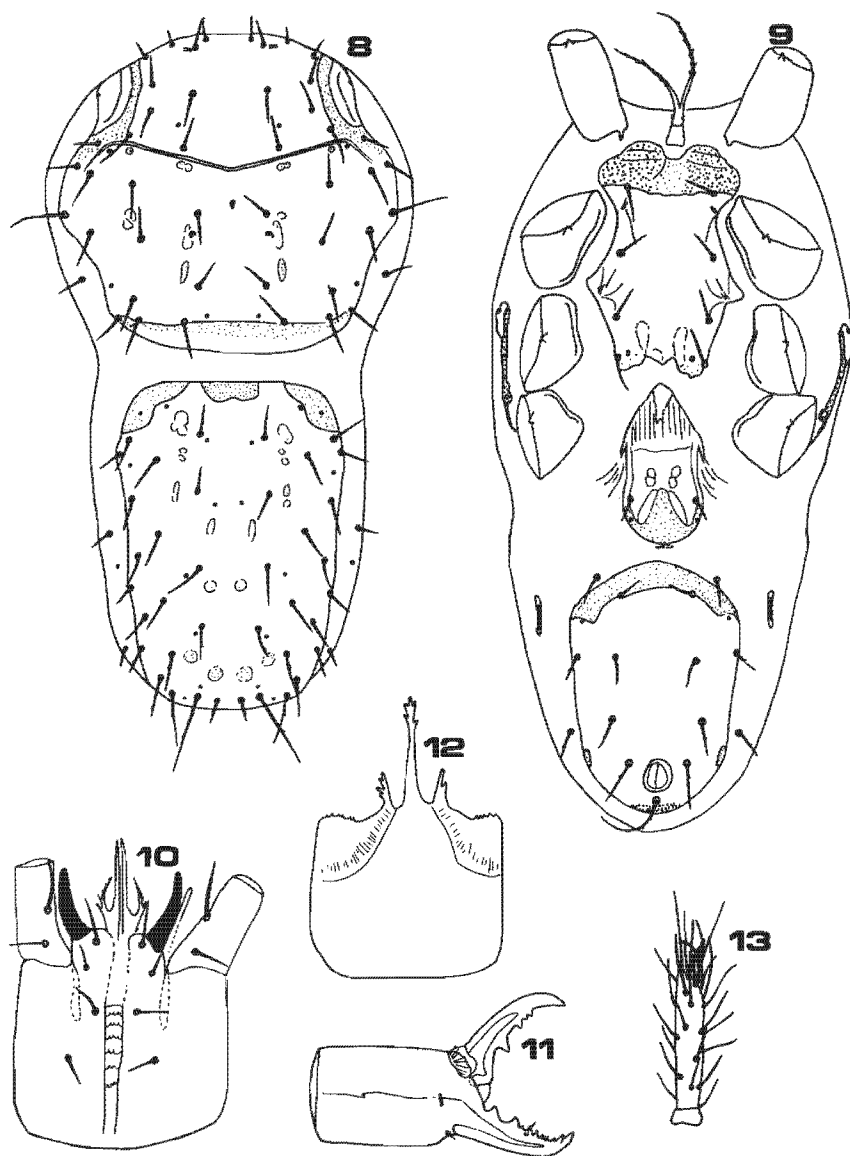
*Rhodacarus thysi* can be distinguished from other known Afrotropical species in having 21 pairs of opisthonotal setae; podonotal shield divided into four parts; pre-endopodal shields absent, sternal setae I situated on anterior margin of sternometasternal shield.

Female. Dimensions. Length (excl. gnathosoma), 283  $\mu\text{m}$ ; breadth, 127  $\mu\text{m}$ ; leg I, 212  $\mu\text{m}$ ; leg IV, 175  $\mu\text{m}$ ; length of genital shield, 67  $\mu\text{m}$ ; breadth (through bases of genital setae), 32  $\mu\text{m}$ ; length of sternometasternal shield, 64  $\mu\text{m}$ ; breadth (through bases of sternal setae II), 44  $\mu\text{m}$ ; postanal seta, 28  $\mu\text{m}$ ; vertical setae, 10  $\mu\text{m}$ ; setae r3, 21  $\mu\text{m}$ ; setae J5, 10  $\mu\text{m}$ ; setae Z5, 28  $\mu\text{m}$ ; setae R5, 15  $\mu\text{m}$ .

Dorsum (Fig. 8). Poorly sclerotized, covered by two sub-equal shields. Podonotal shield broader than opisthonotal shield, divided into four parts by means of unsclerotized, punctate areas and V-shaped horizontal groove; anterolateral parts relatively small and each divided into two by a single ornamentation line, large posterior part provided with a poorly defined, unsclerotized punctate area posteriorly. A number of very indistinct, punctate oviform figures, seven pairs of pores and three refractive structures present in the vicinity of setae j5. Dorsal setae simple and normal complement of six setae each in j, z and s series, five setae in the r series; setae r1, r2–3 and r6 situated on podonotal shield, setae r5 on lateral interscutal membrane, setae r4 absent; setae s1 and z1 relatively short with setae r3 markedly longer than other dorsal setae. Anterolateral parts of shield without setae, setae j2 moved to an anterior position.

Anterior margin of opisthonotal shield with three unsclerotized punctate areas, finely punctate figures and nine pairs of pores; J, Z and S series consist of normal complement of five setae each; setae R1 and R3–5 situated on the shield; setae R2 absent; two pairs of UR setae and a pair of poorly sclerotized pore-bearing platelets on lateral interscutal membrane; setae Z5 conspicuously longer than other opisthonotal setae and finely serrate as setae Z4, J4–5, S5 and R4–5.

Venter (Fig. 9). Tritosternum normal for genus. Presternal region with an uneven anterior margin, a central indistinctly punctate part and a few poorly discernible ornamentation lines. Sternometasternal shield finely punctate, with four pairs of setae with first pair situated on its slightly concave and irregular anterior margin; with three pairs of pores of which central pair associates with poorly discernible ornamentation lines; a pair of very indistinct, oviform figures present on the posterior part; posterior margin strikingly irregular. Epigynial process of genital shield with a rounded tip; vaginal shield (indicated by dotted lines) visible ventrally; shield ornamented as depicted in Fig. 9; paragenital pores situated on punctate part of shield posterior to genital setae. Exopodal shields absent. Peritremal shields poorly developed, each consisting of a small, inconspicuous strip posterior to stigmata with a relatively broader part anterolaterally to peritremes, both parts provided with a pore, the one on posterior part minute. Peritremes short, not extending beyond anterior margin of coxae III. Metapodal shields relatively small and elongate. Anterior margin of ventrianal shield convex and anterior part contains a punctate area, with a pair of pores posterolateral to this area; setae Jv1–3, Zv2 and circumanal setae present on shield; setae Zv1 and Zv3 situated on opisthogastric cuticle; setae Jv3, Zv2–3 and circumanal setae finely serrate; paranal setae relatively long, in line with anterior margin of anal opening; postanal seta distinctly longer than all other opisthogastric setae; with a pair of punctate areas posterolaterally; postanal pad small.



Figs 8-13. *Rhodacarus thysi* spec. nov., Female. 8. Dorsum. 9. Venter. 10. Gnathosoma. 11. Chelicera. 12. Gnathotectum. 13. Tarsus I.

Gnathosoma. Relatively large (Fig. 10); malae externae short, well-developed and slightly incurved; malae internae branched with lateral parts serrate, slightly incurved, inner parts relatively long and smooth. Salivary styli well-developed. Gnathosomal setae 1–4 present with the first pair the longest. Palp femur with al-seta placed in middle third of segment. Capitular groove with six rows of deutosternal denticles, each consisting of 2–4 teeth. Chelicerae (Fig. 11) relatively large, well sclerotized; movable digit with four teeth with the fourth one the largest; fixed digit with subapical tooth, nine small teeth of variable sizes and a pilus dentilis; dorsal seta and a poorly developed lyrifissure present on each chelicera; arthroal membrane at base of movable digit terminates in a setal corona. Anterior margin of gnathotectum (Fig. 12) tripartite, with central projection relatively long and like lateral projections denticulate; lateral parts demarcated by lines. Palpapotete tripartite.

Legs. Tarsus I (Fig. 13) lacking ambulacrum, with obtuse sensory setae on distal part; some setae on tarsi II–IV incrassate and setae pd-3 and ad-3 on tarsus IV relatively long; basifemur II with small spinous seta; ambulacra II–IV normal for the Rhodacarinae and chaetotaxy of legs normal for genus (Lee 1970).

MATERIAL EXAMINED. Holotype female: SOUTH AFRICA: from soil in a *Tarchonanthus* biotope, 20 km south of Kuruman, Northern Cape, 30.x.1977, L. C. Jordaan; 2 female paratypes, from soil under *Acacia erioloba*, Hotazel, N. Cape, 26.x.1977, L. C. Jordaan; 3 female paratypes from soil under *Acacia mellifera*, 90 km north-east of Kuruman, N. Cape, 30.xi.1977, L. C. Jordaan.

#### ACKNOWLEDGEMENTS

We wish to thank the S. A. Council for Scientific and Industrial Research and the Department of Agriculture and Water Supply for financial assistance.

#### REFERENCES

- HURLBUTT, H. 1973. The *Afrogamasellus* Loots and Ryke and *Afrodacarellus* n.gen. (Acarina: Rhodacaridae) of Tanzania. *Acarologia* **15**(4): 565–615.
- LEE, D. C. 1970. The Rhodacaridae (Acari: Mesostigmata); Classification, external morphology and distribution of genera. *Records of the Australian Museum* **16**(3): 1–219.
- LOOTS, G. C. 1969. Notes on *Rhodacarus* Oudemans and its related genera with descriptions of new species from the Ethiopian Region. *Publicações Culturais da Companhia de Diamantes de Angola* **81**: 45–82.
- LOOTS, G. C. & P. A. J. RYKE. 1968. *Afrogamasellus* and *Paragamassellevans*, two new genera of Rhodacaridae (Acari) from soil in the Ethiopian Region. *Wetenskaplike Bydraes van die PU vir CHO*, Reeks B, **11**: 1–16.
- OUDEMANS, A. C. 1902. New list of Dutch Acari, second part. *Tijdschrift voor Entomologie* **45**: 1–52.
- RYKE, P. A. J. 1962. The interpretation of the genus *Rhodacarus* Oudemans with descriptions of new species from South Africa (Acarina: Rhodacaridae). *Revista de Biologia* **3**: 81–86.

Accepted 30 October 1987

(Publication costs borne in full by authors)